

## Metabolic Health

There is a simple but not exactly scientific or completely accurate way to check your metabolic health, but accessing your metabolism using thermal and heart rate indications could reveal issues. The thought is that a good metabolism generates heat, and a slow metabolism does not. A sluggish metabolism is a sign of problems with your metabolic health, such as thyroid function. Here is how you take the test:

- Upon rising, take your temperature and pulse
- After breakfast, take your temperature and pulse
- After lunch, take your temperature and pulse

The favorable result (remember this is a basic test and will not thoroughly assess your metabolic health) is when your temperature rises from waking to after breakfast, and after breakfast to after lunch. Your pulse rate should elevate as well with a slight increase. Don't do the test if you have been moving around without a 10-minute rest. Then, chart your temperature and pulse rate for a week and see what you see. Although some people's body temperature is slightly lower, the normal temperature is 98.6, which should be reached after breakfast. Your pulse rate is normal if it is between 70 and 85 BPM. Some well-trained people may have very low pulse rates, and although that is good for athletics, it may be a sign of a slow metabolism.

### **Blood and urine tests performed by a lab and interpreted by a professional practitioner.**

Metabolic health is the most accurate picture of how healthy you are and your longevity prognosis, along with your health span, which is the most critical measurement in my mind. Here are a few things that measure metabolic health.

**Fasting glucose** – Under 100 is considered decent, while over 126 is regarded as a strong indication of problems.

**A1C** – This test is a snapshot of your blood sugar over time. It is generally agreed upon that anything 6.5 and above is in the diabetic category.

**Fasting Insulin** – This is the test everybody needs and is much better than the above two tests for assessing metabolic health. In addition, A fasting insulin of greater than 15 microunits/ml usually means significant insulin resistance and risk for metabolic disease. From the glucose and insulin levels together, you can calculate an index called the homeostatic model assessment of insulin resistance ( $HOMA-IR = \text{glucose} \times \text{insulin} \div 405$ ), which assesses your risk for diabetes. A HOMA-IR of less than 2.8 is excellent, 4.3 is average, and anything higher means trouble.

Lustig, Robert H.. *Metabolics: The Lure and the Lies of Processed Food, Nutrition, and Modern Medicine* (p. 145). HarperCollins. Kindle Edition.

Although Dr. Lustig says that levels greater than 15 are a significant indicator of insulin resistance, a good level of 4 or under would indicate a likelihood of metabolic health.

**Uric Acid levels** – You can test this at home with a device that operates like a glucometer. Uric Acid levels that are high indicate that you have mitochondrial dysfunction. These levels have to do with liver and kidney function; high levels also indicate the presence of gout. Normal levels are 3.5-7.2. However, you want your levels under 5.

**Lipid profile** (LDL-C, HDL-C, TG) - These can be tricky to interpret correctly. The serum triglyceride (TG), when unloaded of its fat at the adipose tissue, becomes the small dense LDL. Therefore, the TG:HDL (high-density lipoprotein) ratio—the accurate ratio of bad to good cholesterol—is the best biomarker of small dense LDL.

Lustig, Robert H.. *Metabolics: The Lure and the Lies of Processed Food, Nutrition, and Modern Medicine* (p. 143). HarperCollins. Kindle Edition.

The small particle LDL is thought to be the "bad" cholesterol. However, new research is happening that may turn our knowledge of "bad" cholesterol upside down. This included an experiment of eating Oreo cookies to reduce the LDL (typically thought to be caused by eating stuff like Oreo cookies). The experiment reduced the subject's LDL by 70% in 16 days. DO NOT go get Oreo cookies! The point is that this is a field of ongoing research. Don't fret if your numbers aren't that great. It is just possibly one marker of metabolic health.

**Inflammatory Markers** - homocysteine (Hcy) level, C-reactive protein, Plasma Viscosity, Erythrocyte sedimentation rate

These are typical inflammatory markers, and if there is any indication of inflammation, you are not considered metabolically healthy. Homocysteine and C-reactive Protein are the most commonly tested of the four tests mentioned above.

**Liver Health** - (ALT and AST), alanine aminotransferase, and aspartate aminotransferase – Are markers of liver health. Liver health is absolute when it comes to metabolic health.

**Blood Pressure** – Hypertension is a typical indicator of poor metabolic health. Your real blood pressure is taken upon waking before you sit up. So before you take your blood pressure (do it at home for a more accurate reading), sit down and relax for 5 minutes. 120/80 is generally accepted as normal.

Kidney function ( a blood test known as the estimated glomerular filtration rate (eGFR) and a urine test known as the urine albumin-creatinine ratio (uACR). –

**Thyroid function test** - TSH TEST, T4 TESTS, T3 TESTS, FREE T3, REVERSE T3 – You will need a healthcare professional to interpret these tests.

Let me reiterate that you need a medical professional to interpret these results. Usually, you need them to order the labs themselves, but in today's world, you can pay for them from various lab companies. When you are talking with your practitioner, ask for these specific tests. Some of them are rarely done (like fasting insulin), and they will give a better picture of what is happening inside you. You may have other routine tests done or heavy metal tests and other tests as needed. Getting these tests done yearly is good so you can adjust your lifestyle if any numbers start to move in the wrong direction.